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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/502,104	09/19/2005	Dror Shemesh	6317P076	3403
45401 7590 08/23/2007 APPLIED MATERIALS/BLAKELY 1279 OAKMEAD PARKWAY SUNNYVALE, CA 94085-4040			EXAMINER JOHNSTON, PHILLIP A	
			ART UNIT 2881	PAPER NUMBER
			MAIL DATE 08/23/2007	DELIVERY MODE PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

## Office Action Summary

Application No.

10/502,104

Applicant(s)

SHEMESH ET AL.

Examiner

Phillip A. Johnston

Art Unit

2881

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 19 September 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-21 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-21 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 19 September 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date 7-19-2004.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_.

**Detailed Action**

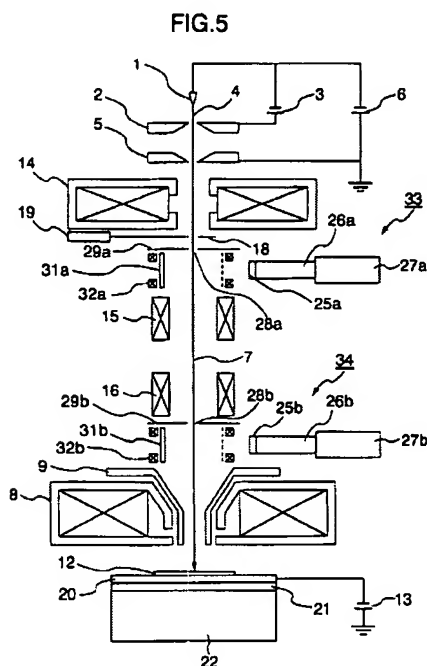
**Claims Rejection - 35 U.S. C. 102**

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1-3,5-11,13-15, and 17-20, are rejected under 35 U.S.C. 102 (b) as being anticipated by Todokoro, U.S. Patent No. 6,084,238.

3. Regarding claim 13, Todokoro discloses a system for multi detector detection of electrons, comprising: multiple interior detectors for providing detection signals; a column through which electrons may propagate (See Figure 5 below);



Todokoro also teaches a means for directing a primary electron beam, through the column, to interact with an inspected object and for directing, by

introducing a substantial electrostatic field, electrons reflected or scattered from the inspected objects towards the multiple interior detectors (See Col. 2, line 20-26; and Col. 5, line 15-26), whereas at least some of the directed electrons are reflected or scattered at small angle in relation to the inspected object. See Col. 8, line 22-52.

It should be noted here that, Todokoro uses an electric field that reaches the surface of the wafer, which inherently implies that electrons, reflected or scattered at small angles, will also be directed up through the acceleration tube towards one of the detectors.

4. Regarding claim 1, Todokoro discloses all the structural limitations therein as pointed out above regarding claim 13.

5. Regarding claims 2,3,14, and 15, Todokoro discloses a first voltage potential difference between the inspected object and a first portion of the column and a second voltage potential difference between a second portion of the column and the inspected object, whereas the first portion of the column is positioned below the second portion and wherein the first voltage potential difference is smaller than the second voltage potential difference. See low acceleration voltage, at Col. 5, line 15-29.

6. Regarding claims 5 and 17, Todokoro teaches the use of different collection zones. See Col. 9, line 36-43.

7. Regarding claims 6-8,18, and 20, Todokoro teaches providing electrostatic or electromagnetic deflectors before and after the diaphragm 18 (note Figure 5 above) so as to suitably deflect the electron beam to adjust its centering (tilt). Col. 5, line 15-44.

8. Regarding claims 9 and 19, Todokoro teaches an inspected area of the inspected object is positioned within the substantial electrostatic lens (note Figure 4); and Col. 8, line 16-21.

9. Regarding claims 10,11, and 20, Todokoro teaches tilting the sample and measuring the inclination (note Figure 12). Col. 14, line 5-50.

***Claims Rejection – 35 U.S.C. 103***

10. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which the subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

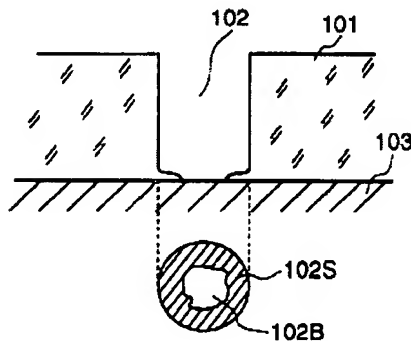
11. Claims 4,12,16, and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,084,238 to Todokoro, in view of Todokoro, U.S. Patent No. 6,635,873.

12. Todokoro (238) teaches all the required limitations of claim 4,12,16, and 21, as pointed out with respect to claim 13 above.

13. Todokoro (238) fails to disclose processing the received detection signals to provide an indication about a defect or a process variation; and wherein detected electrons include electrons from a lower portion of a high aspect ratio hole.

14. Todokoro (873) teaches observing residue at the bottom of a high aspect ratio contact hole. See Figure 14b below; Col. 2, line 8-18; and Col. 5, line 39-49.

**FIG. 14B**



15. Todokoro (873) modifies Todokoro (238) to provide a technique for displaying the condition of a contact hole formed in an insulator on the display screen of a scanning electron microscope.

16. Therefore it would have been obvious to one of ordinary skill in the art that Todokoro (238) would use the contact hole imaging technique of Todokoro (873) to provide a scanning electron microscope for observing the bottom of a contact hole formed on an observation sample such as an IC.

### **Conclusion**


17. Any inquiry concerning this communication or earlier communications should be directed to Phillip Johnston whose telephone number is (571) 272-2475. The examiner can normally be reached on Monday-Friday from 7:30 am to 4:00 pm. If attempts to reach the examiner by telephone are unsuccessful, the examiners supervisor Robert Kim

can be reached at (571)272-2293. The fax phone number for the organization where the application or proceeding is assigned is 571 273 8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

PJ

August 16, 2007

  
**ROBERT KIM**  
**SUPERVISORY PATENT EXAMINER**